June 5, 2007

Ex Parte Presentation

Via Electronic Submission

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street S.W.
Washington, DC 20554

Re: *Amendment of the Commission's Part 90 Rules in the 904-909.75 and 919.75-928 MHz Bands, WT Docket 06-49*

Dear Ms. Dortch:

Progeny LMS, LLC ("Progeny") responds to the letter dated June 1, 2007, by Henry Goldberg and Mitchell Lazarus on behalf of the Part 15 Coalition (the "Part 15 Letter").[1] The Part 15 Coalition letter responds to a proposal by Progeny, dated April 3, 2007 (the "Progeny Proposal").[2] On May 16, 2007, Progeny responded to an earlier letter on the same subject dated May 11, 2007.[3]

Progeny is not at all surprised, nor should the FCC be, that these parties have made a last minute filing of this nature. They have pursued a consistent strategy of delay throughout the prolonged pendency of this proceeding. Their reliance on delay tactics has served to ensure that they alone continue to access a band in which their nominal status is tertiary.

Progeny, on the other hand, has repeatedly demonstrated to the FCC that Multilateration-Location and Monitoring Service ("M-LMS") flexibility changes that

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[1] Letter from Henry Goldberg and Mitchell Lazarus, Counsel for the Part 15 Coalition, to Marlene H. Dortch, Secretary, FCC, WT Docket 06-49 (filed June 1, 2007).

[2] Letter from Progeny to Marlene H. Dortch, Secretary, FCC, WT Docket 06-49 (filed Apr. 3, 2007).

[3] Letter from Henry Goldberg & Mitchell Lazarus, Counsel for the Part 15 Coalition, to Marlene H. Dortch, Secretary, FCC (filed May 11, 2007); Letter from Progeny to Marlene H. Dortch, Secretary, FCC, WT Docket 06-49 (filed May 16, 2007).

it has sought for more than five years would cause no more interference to Part 15 devices than would other Part 15 devices.[4] It is important to remember why the Commission initiated this proceeding for a comprehensive re-examination of the Part 90 rules for M-LMS licenses.[5]

M-LMS rules have not been updated since 1995. Twelve years is much more than a lifetime in terms of technological change. As Progeny has previously noted, in this time, flexibility for spectrum-dependent services has been applied across most licensed bands. Spectrum sharing has evolved as established federal policy, a policy that remains a centerpiece of federal regulatory efforts as part of the President's Spectrum Initiative. Moreover, technology advances have improved interference mitigation techniques, further enabling effective sharing. Importantly, the market for location-based services has undergone a major change since the enactment of M-LMS rules more than a decade ago, with improvements in GPS capabilities and the FCC Enhanced 911 requirements as key catalysts.

The NPRM itself acknowledged these vastly changed circumstances: "We initiated this proceeding to evaluate the ability of our Part 90 M-LMS rules to afford licensed service providers greater flexibility to respond to changing market conditions."[6]

It has taken the Part 15 Coalition more than 15 months since the issuance of the M-LMS NPRM, and more than five years since Progeny's request for rulemaking, to submit a technical statement to the Commission regarding these proposed flexibility changes for M-LMS systems.

Nonetheless, the Coalition's letter is merely a continuation of their tactics of the past five years to prevent the FCC from allowing these licensees to be put into use to serve the public:

- It purports to be a compromise to the Progeny Proposal; it is not. Every "concession" is matched by one or more additional strictures or conditions.

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[4] Progeny LMS, LLC, In the Matter of Amendments of the Commission's Part 90 Rules in the 904-909.75 and 919.75-928 MHz bands, Comments, WT Docket 06-49, filed May 30, 2006 (Progeny Comments). "Progeny previously has demonstrated to the Commission that an LMS system operating at 30 Watts ERP (effective radiated power) would cause no more interference to Part 15 devices than would other Part 15 devices."

[5] Amendment of the Commission's Part 90 Rules in the 904-909.75 and 919.75-928 MHz bands, Notice of Proposed Rulemaking, WT Docket 06-49, Rel. March 7, 2006 (NPRM).

[6] NPRM, ¶ 2.

Every bit of "movement" is overmatched by demands or conditions which would absolutely prevent Progeny from creating a viable business. In fact, the terms offered by the Part 15 Letter leave Progeny with far *less* than it has today under the existing Part 90 rules. The Coalition's transparent hope is that by announcing that it is "ready to participate," it can move the entire proceeding backward in time.

- Its conclusions and recommendations are based on assertions and flawed engineering, and demonstrate a lack of understanding of the public record on this matter. (A rebuttal of the Part 15 Coalition's technical analysis appears below).

- It blindly repeats the refrain that the FCC should do nothing and that Progeny should reveal its business plan, intended use of the spectrum, and even such details as its planned data rate and packet error rate – details that are clearly proprietary and not germane to the FCC, which is technology neutral.

- It was filed a full year after comments to the NPRM were due (May 30, 2006). Now that the FCC is reported to be close to acting in this matter, the Part 15 Coalition finally puts forward its first engineering analysis, albeit flawed. Upon review, the filing deserves no consideration.

The FCC must be aware that to give any attention, much less credence, to the type of regulatory gamesmanship displayed here will assure an increase in similar behavior by other parties desiring to preserve the status quo and safeguard their narrow interests at public expense. The Coalition's letter, filed in the eleventh hour of this proceeding after the Commission has already established a full record to grant flexibility to M-LMS licensees, does not advance the goals articulated by the Commission in the NPRM: "Our goal in this proceeding is to consider whether greater opportunity can be afforded M-LMS licensees to provide services while ensuring continued access for other licensed and unlicensed uses that share this band."

By erecting technically flawed roadblocks in a late-filed analysis, the Coalition would stymie – rather than advance – these important spectrum sharing objectives. There are simply too many important public interest objectives at stake in this proceeding to pursue the path laid out by the Coalition, which would simply reinforce a status quo to the benefit of unlicensed incumbents and to the detriment of more efficient and effective use of this band by other users. As Progeny has previously noted, this proceeding provides the Commission an opportunity to update long outmoded policies in this band to promote valuable homeland security services,

establish a balance between licensed and unlicensed uses, and provide incentives for all users of the band to adopt spectrum efficient technologies.

Response to Mr. Stevenson's Technical Analysis

The Part 15 Letter contains a response to the Progeny Proposal in the areas of CPE, base stations and testing, and safe harbor. The Coalition's position on these matters derives from the technical analysis of Mr. Carl R. Stevenson. Unfortunately, Mr. Stevenson's analysis is deeply flawed and based on a misrepresentation of Progeny's filings. Therefore, it provides an unsound basis for the Coalition's response. We first provide a rebuttal to Mr. Stevenson's analysis, and then we respond to the Coalition's "counterproposal."

Mr. Stevenson has ignored the vast majority of Progeny's technical submissions into the docket.

It is noteworthy that Mr. Stevenson's technical analysis is the first such analysis to be put forward by any opponent of Progeny during the five years this matter has been pending. Sadly, his analysis is incomplete and ignores much of the research, analysis and field measurements that informed the Progeny Proposal to the FCC.[7]

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[7] A few of the key documents authored by Progeny which were apparently not considered by Mr. Stevenson include:

- *LMS Compatibility with Part 15 Devices: The Case for Spectrum Flexibility, A White Paper,* submitted as an attachment to Letter from Progeny LMS, LLC to Marlene H. Dortch, Secretary, FCC (Oct. 8, 2002). This paper provides detailed link budgets and interference calculations demonstrating that a worst case M-LMS system (high data rate, high reliability) creates no greater risk of interference to Part 15 devices than Part 15 devices already pose to one another.

- *Analysis of LMS Interference to and from Cordless Telephones,* submitted as an attachment to Notice of Ex Parte Communication from Progeny to Marlene H. Dortch, Secretary, FCC (filed Feb. 27, 2007). This technical analysis demonstrated that cordless telephones and other indoor Part 15 devices would not receive harmful interference from an M-LMS system operating at the power levels proposed by Progeny in its NPRM response and Proposal.

- *902-928 MHz Spectrum Utilization Study,* submitted as an attachment to Comments of Progeny LMS, LLC in FCC WT Docket No. 06-49 (filed Mar. 14, 2007). This presentation summarized the results of almost one million data points measured by Progeny LMS in the Washington DC

Mr. Stevenson has manipulated and distorted Progeny's previous engineering analyses in order to create confusion, conjure and doubt.

In all of its technical analyses, Progeny has gone to great lengths to illustrate the effects of a "worst case" M-LMS system on Part 15 devices, i.e., the effects of an M-LMS system designed for maximum coverage and reliability. Progeny's purpose in doing so has always been to keep its analysis as conservative as possible and thereby highlight that an M-LMS system will not cause unacceptable interference to unlicensed devices in the band.

Mr. Stevenson has distorted this sound engineering practice by asserting that Progeny "intends to squeeze all the bandwidth it can" from its licensed spectrum, and that "Progeny's plans, if unchanged, would cause serious harm to Part 15 operations."[8]

To cite one particular example, Mr. Stevenson devotes almost half of his technical analysis to a postulated M-LMS receiver with a sensitivity of -68.8 dBm that he claims Progeny intends to build.[9] He goes on at length to demonstrate that an M-LMS designed around this receiver sensitivity would result in severe co-channel and adjacent channel interference.[10] Sadly, Mr. Stevenson has taken Progeny's analysis completely out of context and drawn wildly inaccurate conclusions.

Progeny has *never* claimed that its receiver sensitivity would be -68.8 dBm. Mr. Stevenson has taken this figure from Appendix B of its NPRM Comments.[11]

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metropolitan area to illustrate that the M-LMS band is "quiet" more than 99% of the time and therefore represents an extremely inefficient use of spectrum.

[8] Technical Statement of Carl R. Stevenson, Comments and Recommendations in Response to the Progeny Proposal, submitted as an attachment to Letter from Henry Goldberg and Mitchell Lazarus, Counsel for the Part 15 Coalition, to Marlene H. Dortch, Secretary, FCC (June 1, 2007).

[9] *Id.*

[10] *Id.*

[11] Mathematical Demonstration: Reducing Power from 30 Watts SRP to 6.1 Watts SRP Does Not Impact The Area of Potential Interference to Part 15 Devices, Appendix B, submitted as an attachment to Comments of Progeny LMS, LLC in FCC WT Docket No. 06-49 (filed May 30, 2006).

There, Progeny performed an analysis of the number of base stations required to cover a fixed geographic area at several different base station power levels. Progeny selected an arbitrary circle of radius 10 miles for its analysis. Using free space path loss because it was the worst case, Progeny then calculated that an M-LMS signal transmitted at the allowed limit of 30 Watts ERP (or 46.9 dBm EIRP) would be attenuated to -68.8 dBm at the edge of the circle.[12] In other words, the selection of -68.8 dBm was merely a reference point used to demonstrate that the area of interference (as a percentage of a fixed coverage area) is independent of the base station power level.

This was explained clearly and in plain English in Progeny's NPRM Comments.[13] However, by latching onto this figure and projecting it far beyond its intended purpose, Mr. Stevenson has not only completely missed the point of Progeny's analysis; he has introduced more confusion and doubt into the discussion.

CPE devices in an M-LMS network may be limited to the power levels established for Part 15 devices (except in emergency conditions), but they should not be subject to additional compatibility testing.

Mr. Stevenson claims that Progeny's offer to operate its CPE device within Part 15 power limits (except in emergency conditions) is "flawed" because many Part 15 devices operate below the maximum allowed power.[14] Progeny never offered to operate at the power limits of *some* or *most* Part 15 devices, but rather at the power limit *available to all* Part 15 devices.[15] In doing so, the FCC would be assured that Progeny's operation would have no more impact on Part 15 users than do other Part 15 users who, of course, are free to operate at the full power limits granted under Part 15.

Mr. Stevenson is willing to "concede" that Progeny may operate at Part 15 power levels, as long as Progeny complies with Part 15 rules for "compatibility

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[12] *Id.*

[13] *See supra*, note 8.

[14] *Supra*, note 5.

[15] *Supra*, note 7.

testing"[16] and adjacent channel interference. The concept of subjecting an M-LMS system to Part 15 rules other than power limits was not suggested by the Commission in the NPRM; was not a part of Progeny's proposal to the FCC; and is not germane to the discussion. Instead, Progeny has offered to employ closed loop power control to minimize the risk of interference; to rely on power spectral density limits rather than power limits, more accurately reflecting the interference sensitivity of modern digital radios; and finally, replacing the impractical field testing requirements of Section 90.353(d) with a reasonable coordination process.[17] In addition, Progeny is prepared to comply with Section 15.247(c) rules governing out of band emissions.

Mr. Stevenson goes on to object to Progeny's proposal that its CPE be allowed to operate at 10 Watts EIRP in emergency conditions, on the grounds that it would "increase[e] the potential for major disruptions."[18] He does not in any way substantiate or elaborate upon this claim. It should be noted that Progeny is currently allowed 30 Watts ERP for both its base stations *and* its CPE, and in fact Progeny is yielding a significant amount of its allowed power for CPE in the Proposal it has put forward.

The M-LMS field testing requirement in Section 90.353(d) is impossible to comply with and must be replaced with technical rules and coordination triggers.

Throughout the proceeding, Progeny has repeatedly requested that the field testing requirement in Section 90.353(d) be replaced with specific technical limits and a coordination process triggered when unacceptable interference occurs. In its Proposal, Progeny defined the specific technical limits; the conditions that trigger a coordination process; and the remedy to be employed when necessary.[19] The Part 15 Letter did not address any of these elements; instead, it issued a flat rejection of the process; blindly insisted that Section 90.353(d) stand without alteration; and added the further constraint that M-LMS systems undergo "compatibility testing," though this was never defined.[20]

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[16] Mr. Stevenson does not define "compatibility testing" nor provide a reference in 47 C.F.R. § 15 (2007). In fact, Part 15 devices themselves are not required to undergo compatibility testing with one another.

[17] *Supra*, note 2.

[18] *Supra,* note 2.

[19] *Id.*

Ironically, Mr. Stevenson himself highlights the literal impossibility of field testing under Section 90.353(d) when he writes: "Most [Part 15] users have no idea what part of the band their devices operate in. Usage varies in many dimensions (time, location, terrain, activity of other users, etc.) and is, by its nature, uncoordinated."[21]

Not only is Section 90.353(d) an impractical requirement, anyone with experience in these matters can predict that some parties will see it as an invitation to become a Part 15 user only to claim interference from M-LMS and inevitably settle the claim in return for payment.

Reducing the M-LMS base station power limits will lead to more, not less, interference between M-LMS systems and Part 15 devices

Mr. Stevenson goes to some length to refute Progeny's analysis (in Appendix B to its NPRM response) that reducing M-LMS base station power will not affect the area of interference. Unfortunately, his analysis is severely flawed and his conclusion is demonstrably incorrect.

First, he chose to use free space path loss to model the interference across a 10 mile coverage radius (or 314 square mile coverage area).[22] In reality, signals from Part 15 devices (and from M-LMS systems operating in the band) encounter far greater path loss, reducing the practical likelihood of interference.[23] If his interference analysis and graphs were correct, any WISP operating at 4 Watts would interfere with all Part 15 devices in an area of 100 to 200 square miles – a situation the FCC clearly would not tolerate. Mr. Stevenson appears to have chosen to use free space path loss for his calculation because Progeny had used the same formula in Appendix B to its NPRM response, but as noted above, Progeny was analyzing an entirely different situation (the effect of M-LMS on adjacent channel AMR devices) in a purely theoretical analysis that was independent of the path loss formula.

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[20] *Supra*, note 5. It would be grossly unfair to impose a rule for compatibility testing on M-LMS devices when such a rule does not exist for Part 15 devices operating in the same band.

[21] *Id.*

[22] *Id.*

[23] Ironically, the Part 15 Coalition itself argued against the use of free space path loss when calculating interference in its Ex Parte filing of May 11, 2007. Notice of Ex Parte Communication from Henry Goldberg & Mitchell Lazarus, Counsel for the Part 15 Coalition, to Marlene H. Dortch, Secretary, FCC (filed May 11, 2007).

Second, Mr. Stevenson never presents any actual results from his analysis. He asserts that the "joint probability of interference to Part 15 will be reduced because of the set time/space/frequency/usage variables will increase," but he fails to produce a calculation or sensitivity analysis.[24] His entire conclusion is conjecture.

M-LMS base stations operating under the limits proposed by Progeny will not create harmful adjacent channel interference

Mr. Stevenson makes a lengthy argument that an M-LMS system operating at the levels proposed by Progeny will cause harmful interference to adjacent channels.[25] Once again, his analysis is deeply flawed due to a distortion of one of Progeny's earlier technical analyses.

Mr. Stevenson bases his analysis on a statement made by Progeny in Appendix B of its NPRM response that "it is a standard engineering practice for radio receivers to be able to tolerate signals transmitting up to and beyond -28.8 dBm in adjacent channels."[26] Progeny selected the -28.8 dBm figure because of its relationship (40 dB offset) from the strength of an M-LMS signal 10 miles from a base station operating at full power. This figure was clearly explained in Progeny's analysis as a reference point for a theoretical analysis of the number of base stations required to cover a fixed area.[27] Progeny never stated that it would create -28.8 dBm of energy in adjacent channels. Consequently, all of Mr. Stevenson's analysis from that point forward should be discarded.

However, even if his analysis were to be considered, it is not applicable to digital radio systems. The analysis claims to be characterizing a data link radio (which by definition is digitally modulated and wide band), but it expresses interference impact in terms of SINAD (Signal to Noise and Distortion). SINAD is only used to characterize the audio quality of narrowband FM voice grade communications; it is not a meaningful metric for characterizing the mutual impact of two digitally modulated carriers operating in adjacent channels. If this analysis were correct, then 802.11 a, b, and g should not be capable of operating on

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[24] *Supra*, note 5.

[25] *Id.*

[26] *Id.*

[27] *Supra*, note 7.

adjacent channels in close proximity to each other – which of course they do quite nicely.

Response to the Part 15 Coalition's "Proposal"

In light of many inaccuracies and distortions throughout Mr. Stevenson's analysis, most aspects of the Part 15 Letter's proposal should be rejected. Progeny therefore states its position as follows:

CPE and Base Stations

a) No change in the Progeny Proposal of April 3, 2007, including power limits, power spectral density limits, and the interference coordination process.[28]

b) We accept the out of channel emission requirement defined in Section 15.247(c). (We believe the Part 15 Letter erroneously referenced Section 15.247(d), which does not address out of band emissions).

c) We oppose any imposition of a duty cycle limitation for M-LMS devices operating on channels whose bandwidths exceed 500 kHz. Part 15 imposes no duty cycle restrictions on Part 15 devices operating on channels over 500 kHz (such as 802.11), and to impose such a rule on licensed spectrum would be grossly unfair.

d) M-LMS power should be expressed in terms of average power, not peak power, consistent with current FCC rule setting in other bands (including the Part 15 UNII band), which recognize that modern digital communications do not cause interference based on peak power levels.

Test and Safe Harbor

a) No change the Progeny Proposal of April 3, 2007, including replacement of Section 90.353(d) with the interference coordination process.[29]

Further Technical Details

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[28] *See supra*, note 2.

[29] *Id.*

a) Progeny rejects the request to provide information related to its waveforms, channels widths, and emission masks. FCC rules should be technology neutral.

While this letter represents the first technical filing thet Coalition has made in this docket, and further instantiates its embrace of an approach that will only advance its own interests, Progeny has not stood still throughout the long-standing pendency of this proceeding.

Instead, Progeny has struck strategic agreements and taken other steps to ensure that this spectrum is put to its best use and full potential, including: (1) Announced its intent in October 2006 to contract with Purdue University researchers to study uses of the spectrum. (2) Reached an agreement with Rajendra "Raj" Singh, Ph.D., for cooperation in developing a range of Enhanced Position Location and wireless broadband data systems. (3) Reached an agreement that will provide development capital and broader access to capital markets through Columbia Capital, a venture capital firm specializing in the communications and information technology industries. (4) Named Carson E. Agnew, former executive vice president and chief operating officer for Mobile Satellite Ventures, as president.

We have laid the groundwork for efficient and effective use of this band and now we call upon the FCC – as we have done throughout the proceeding – to finally issue rules which will allow Progeny and other licensees to serve the public.

In accordance with Section 1.1206(b) of the Commission's Rules, this letter is being filed with your office. Should you have any questions or concerns in connection with this submission, please contact me at (202) 371-2800.

Respectfully submitted,

Janice Obuchowski

cc: Chairman Kevin J. Martin
Commissioner Michael J. Copps
Commissioner Jonathan S. Adelstein
Commissioner Deborah Taylor Tate
Commissioner Robert M. McDowell
Bruce Gottlieb, Office of Commissioner Copps
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